REMARKS

Claims 1, 3, 5, 6, 8-10 and 12 are pending. Arguments are submitted for overcoming the rejection based on the newly cited prior art references. Accordingly, Applicant submits that the present application is in condition for allowance.

I. Claim Rejections - 35 USC 103(a)

A. In the Office Action dated January 8, 2008, claims 1, 3, 5 and 6 are rejected under 35 USC 103(a) as being obvious over U.S. Patent No. 3,892,490 issued to Uetsuki et al.

Applicant respectfully requests reconsideration of the above referenced rejection with respect to independent method claim 1 of the present application which requires certain limitations with respect to a "shield" that is simply not disclosed, suggested or taught by the newly cited Uetsuki et al. reference.

In the Office Action, it is simply stated that Uetsuki et al. disclose a shield member (18). For example, the Office Action reads, as follows:

> "In one embodiment, the evaporative material can be mounted on a revolving holder 14 and exposed to an electron beam through a ***shield member 18***, in which the electron beam can be generated from a number of conventional sources such as an electron emitting filament 20 which is aimed or directed towards the source 16 of the appropriate coating material by an electro-magnet 22 (col. 4 lines 19-30)."

However, independent method claim 1 of the present application includes limitations relative to the "shield" more than requiring the mere presence of the shield. For example, independent method claim 1 of the present application requires "a shield opaque to electrons being arranged ***to cover a portion of the surface <u>contacted</u> by said beam of electrons***" and further requires the method step of "causing relative rotational movement between the container on one hand and the shield and the beam of electrons on the other hand such that ***said portion of***

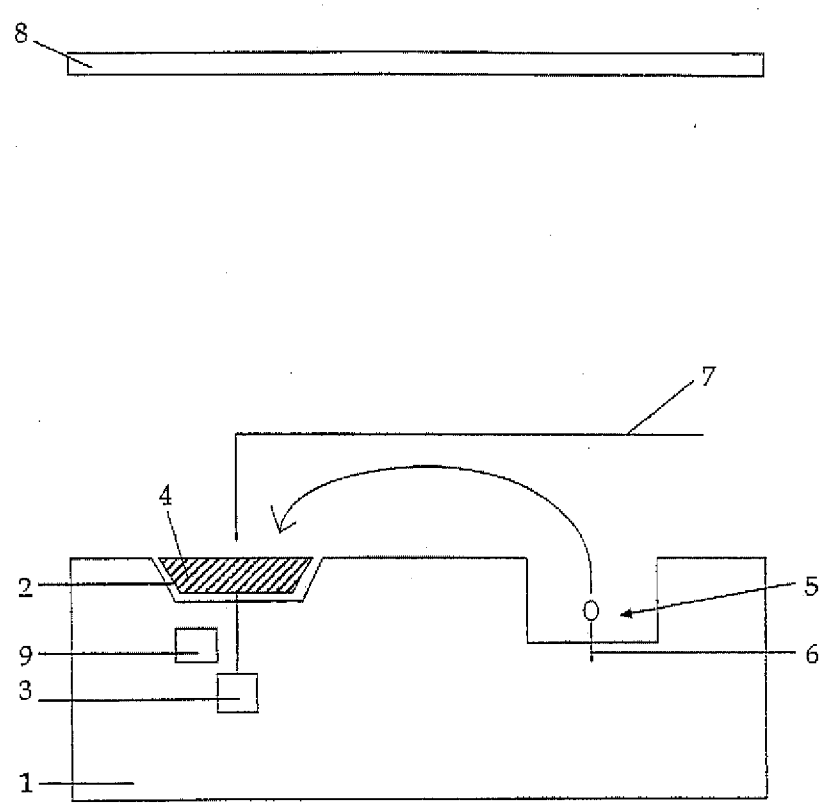
the surface <u>previously contacted</u> by the beam of electrons is no longer covered by the shield and is exposed to the substrate".

The above highlighted limitations are important for the following reasons. The present invention relates to a continuous process for depositing material onto a substrate and to an apparatus used for this purpose. As stated on page 1, lines 23-26, of the present application, as filed, a major disadvantage of electron beam evaporation with respect to the formation of semiconducting substrates bearing an array of organic light emitting diodes is the presence of so-called "secondary electrons" which are emitted from the material being evaporated upon direct impact by the beam of electrons fired by an electron gun. The secondary electrons damage polymeric layers of organic light emitting diodes on which the material is intended to be deposited. Accordingly, the present invention is directed to solving this problem and protecting substrates from damage by secondary electrons.

The container, or crucible, of the present invention is positioned partly under a shield and is rotated relative to the shield such that: (i) a part of the surface of the material in the container directly impacted by a beam of electrons is shielded from the substrate; and (ii) at the same time, another part of the surface of the material is unshielded relative to the substrate. Evaporation of the material takes place from the ***unshielded part*** of the surface of the material by latent heat. During this deposition process, ***the shield prevents any secondary electrons emitted from the shielded part of the material (at the location where the beam of electrons directly impinges upon the material) from reaching the substrate.***

Independent method claim 1 of the present application clearly requires a shield to be arranged to cover only **<u>a portion</u>** of the surface of the material which is to be deposited by evaporation onto a substrate. For example, in the drawing figure of the present application

(shown below), an upwardly-open container (2) enables the top surface of the material (4) to be exposed to a beam of electrons (represented by the arrow) emitted from an electron gun (5). The shield (7) permits the beam of electrons to directly impact upon a portion of the surface of the material (4) which is illustrated in the drawing as the right side of the material. The shield (7) does not extend over the opposite side of the material (ie., the left side as shown in the drawing), and the beam of electrons are prevented by the shield from directly impacting on the left side of the material. Thus, the shield (7) is able to protect the substrate (8) from secondary electrons emitted from the impact of the beam on the right side of the surface of the material (4) because ***the location of impact is located underneath the shield***. However, the unshielded left side of the material (4) evaporates as a result of latent heat, and this evaporated material is permitted to deposit onto the substrate since the shield does not extend over the left side of the material.



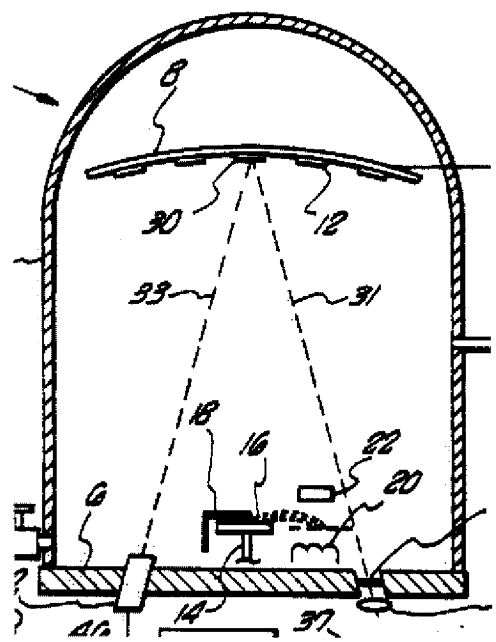
Accordingly, areas of the surface of the material (4) having been directly impacted by the beam rotate from the right side of the material extending underneath the shield (7) to the left side where it is no longer underneath the shield (7) and is exposed to the substrate. At the same time, areas unshielded from the substrate move under the shield and are in position to be directed impacted by the beam. Deposition of the material (4) onto the substrate (8) is via evaporation from the unshielded, or left side (as shown in the drawing) of the surface of the material (4), and not from the right side of the surface of the material (4) located directly under the shield and exposed to the beam of electrons.

The purpose of this arrangement is best stated on page 2, lines 20-23, of the present application, as filed, which states:

> "The shield prevents secondary electrons from reaching the substrate, and material is evaporated from a portion of the surface not actually contacted by the beam of electrons but still subject to residual heat by virtue of having been so contacted previously."

Compare the above described arrangement of the present invention with that taught by the Uetsuki et al. patent, which is shown in the drawing on the following page. With reference to the drawing of Uetsuki et al., an evaporative material source (16) is mounted on a revolving material holder (14). An electron beam (shown by dashed lines) generated from an electron emitting filament (20) is aimed at the evaporative material source (16) by an electro-magnet (22). As clearly shown in the drawing, the electron beam impacts a portion of the evaporative material source (16) that is located on the right side of the holder (14) and that is not covered by a shield member (18). Thus, material is evaporated from the right side of the holder (14) from the location on which electron beam impacts the evaporative material source (16). With this arrangement, the substrate (12) is exposed to "secondary electrons" emitted from the material

(16) being evaporated upon direct impact by the electron beam. Unlike the present invention, the shield member (18) of Uetsuki et al. provides no protection to the substrate (12) from secondary electrons produced at the impact site of the evaporative material source (16) with the electron beam. Compare the positioning of the shield (7), electron beam (shown with an arrow), and substrate (8) in the drawing of the present application (shown previously) with the shield (18), electron beam (shown by dashed lines), and substrate (12) of the Uetsuki et al. patent (shown below).



Accordingly, independent method claim 1 of the present application requires a beam of electrons to contact the material to be deposited whilst covered by a shield opaque to electrons. Subsequently, the portion of the surface of the material previously contacted by the beam of electrons is moved out from under the shield to a position where it is exposed to the substrate.

The purpose of the shield of the present invention is to prevent secondary electrons, emitted from the material at the impact site, from damaging the substrate.

In contrast, Uetsuki et al. discloses an electron beam striking a portion of the material source (16) which is not covered by the shield member (18). The unstated purpose of the shield of Uetsuki et al. clearly has no relation to protecting the substrate (12) from secondary electrons. Uetsuki et al. clearly fails to disclose, suggest, or teach a method requiring shielding of the part of the material surface contacted by a beam of electrons from the substrate and then moving that part to an exposed position where evaporation can be accomplished via latent heat.

Further, Uetsuki et al. "teaches away" from the present invention. For example, Uetsuki et al. teaches that evaporation should be permitted at the electron beam impact site from the material source to the substrate, and then, this portion of the material source should be rotated underneath a shield (18) which should prevent any evaporation via latent heat from the source material underneath the shield (18) to the substrate (12). This is the exact opposite of that required by independent method claim 1 of the present application.

Still further, Uetsuki et al. clearly fail to provide motivation to one of ordinary skill in the art to provide the method steps required by independent claim 1 of the present application. Uetsuki et al. relate to providing antireflective coatings on glass lens substrates. The antireflective coating materials of Uetsuki et al., such as ZrO_3 and MgF, are not damaged by secondary electrons. Thus, there is simply no common sense reason for Uetsuki et al. to shield the substrate from secondary electrons. Thus, Uetsuki et al. are clearly not even aware of the problem of secondary electrons, much less providing a solution to such a problem.

For the reasons discussed above, Applicant respectfully submits that independent method claim 1 and dependent method claim 3 are not obviated by Uetsuki et al. and are patentable over

the Uetsuki et al. patent. Applicant respectfully requests reconsideration and removal of the rejection of claims 1 and 3. In addition, Applicant submits that apparatus claims 5 and 6 are patentable over Uetsuki et al. for similar reasons.

B. *In the Office Action dated January 8, 2008, claims 8-10 and 12 are rejected under 35 USC 103(a) as being obvious over U.S. Patent No. 3,892,490 issued to Uetsuki et al. in view of U.S. Patent No. 4,303,694 issued to Bois or U.S. Patent No. 4,514,437 issued to Nath.*

The deficiencies of the disclosure provided by the primary reference, Uetsuki et al., relative to independent method claim 1 of the present application are discussed above in detail. The secondary references, Bois and Nath, fail to overcome these deficiencies and are simply relied upon for their showing of an additional heat source. Accordingly, Applicant respectfully submits that dependent method claims 10 and 12 are patentable over Uetsuki et al. in view of Bois or Nath for the same reasons that independent claim 1 is patentable over the Uetsuki et al. patent. See argument provided above. Further, Applicant submits that dependent apparatus claims 8 and 9 are patentable for similar reasons.

Applicant respectfully requests reconsideration and removal of the rejection.

II. Conclusion

In view of the remarks, Applicant respectfully submits that the rejections have been overcome and that the present application is in condition for allowance. Thus, a favorable action on the merits is therefore requested.

Please charge any deficiency or credit any overpayment for entering this Amendment to our deposit account no. 08-3040.

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